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Published in:
Geophysical Research Abstracts

Publication date:
2011

Document Version
Publisher's PDF, also known as Version of record

Link back to DTU Orbit

Citation (APA):
Andersen, O. B., & Stenseng, L. (2011). Short wavelength marine gravity field modeling from Cryosat-2. A new era in high resolution gravity field modeling? *Geophysical Research Abstracts*, *13*, [EGU2011-9819].

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Geophysical Research Abstracts
Vol. 13, EGU2011-9819, 2011
EGU General Assembly 2011
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Short wavelength marine gravity field modeling from Cryosat-2. A new era in high resolution gravity field modeling?

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Despite the huge improvement in high resolution marine gravity field modeling during recent years Cryosat-2 offers a unique dataset with respect to improving both the accuracy but also the spatial resolution of existing global gravity fields (i.e. DTU10GRA). The Delay Doppler altimeter onboard Cryosat-2 offers the following benefits with respect to conventional satellite altimetry: Factor of 20 improvements in along track resolution. Along-track footprint length that does not vary with wave height (sea state). Improved precision in sea surface height measurements / sea surface slope measurements. These improvements are studied with respect to retrieval of short wavelength marine gravity field signal. However, upward continuation of the causing geophysical signals from bathymetric features at the sea bottom and smoothing the altimeter observations resulted in the best recovery of geophysical signal for 5-Hz cryosat-2 observations.
The first results with respect to resolution and noise of gravity field prediction are presented using various Cryosat-2 data (LRM L2 and LRM L1 as well as SAR mode data) and the findings are evaluation against conventional gadar altimeter data from older Geodetic missions onboard ERS-1 and Geosat.